

NRC 20th Annual Regulatory Information Conference (RIC)

IOUs and Action Items

March 11 – 13, 2008

Track 1	General Plenary Sessions	
Track 2	Operating Reactors	
Track 3	Reactor Research	
Track 4	New Reactors	
Track 5	Security, Emergency Preparedness, Fuel Cycle	
Track 6	Regional Breakout	

Below are questions that were not addressed by the chair or panel members during technical sessions. Answers will be posted as they are provided. For more information, please contact the designated session coordinator.

Tuesday, March 11, 2008

4:00 pm – 5:30 pm Salon F-H	Emerging Issues: Materials and Mechanical Track 2 – Operating Reactors
	All questions answered onsite. Session Chair: Michele Evans, NRC/NRR Session POC: Leslie Miller, NRC/NRR, tel: (301) 415-1037 e-mail: LSM2@nrc.gov
4:00 pm – 5:30 pm Salon D	Environmental Reviews for New Reactors: Looking Back and Looking Forward Track 4 – New Reactors
	<p>Question 1: Requirements related to EMS and AMS apply to activities carried out by federal agencies. It seems like they do not apply to nuclear plant owners who are not federal agencies. How do you see these fitting into a regulator/licensee environment?</p> <p>Question 2: How broad of a scope should be considered when conducting cumulative effects analysis? Time frame? Previous impacts?</p> <p>Question 3: Boling, given NEPA and CEQ requirements, and your familiarity with other Agency practices, what is your perspective on NRC's potential new interpretation that would require ERS to segregate non-NRC regulated activities?</p> <p>Question 4: How many NEPA cases have involved NRC?</p> <p>Question 5: When predicting cumulative efforts, does consideration have to be given to</p>

	<p>possible accidents?</p> <p>Question 6: If a COL applicant is not seeking an LWA, is it still necessary for the ER to “segregate” pre-construction impacts? Isn't it the “LWA impacts” that must be segregated?</p> <p>Question 7: Because NRC evaluation of both pre-construction environmental impacts will bound evaluation of construction impacts alone, what is the practical benefit/purpose/rationale of requiring these impacts be segregated? How is the separation requirement consistent with the redefinition of “construction,” which is intended to focus NRC’s attention on NRC-regulated activities?</p> <p>Session Chair: Jim Lyons, NRC/NRO Session POC: Tamsen Dozier, NRC/NRO, tel: (301) 415-2272 e-mail: TSD2@nrc.gov</p>
<p>4:00 p m – 5:30 p m Brookside</p>	<p style="text-align: center;">Emergency Preparedness and Incident Response Track 5 – Nuclear Security, Emergency Preparedness, Fuel Cycle</p> <p>All questions answered onsite.</p> <p>Session Chair: Mel Leach, NRC/NSIR Session POC: Ned Wright, NRC/NSIR, tel: (301) 415-5563 e-mail: NXW1@nrc.gov</p>
<p>4:00 p m – 5:30 p m Salon E</p>	<p style="text-align: center;">Getting Ahead of Performance Issues Track 2 – Operating Reactors</p> <p>Question 1: In the area of OpE, should the licensees be held accountable for equipment issues from outside the nuclear industry for a piece of equipment that is installed in our plants?</p> <p>Answer 1: Licensees benefit from applying OpE from all sources. Licensees should be aware of what equipment is installed in their plant and should obtain available OpE for that equipment consistent with the provisions of Appendix B and the Maintenance Rule (10 CFR 50.65).</p> <p>Session Chair: Fred Brown, NRC/NRR Session POC: Steve Vaughn, NRC/NRR, tel: (301) 415-3640 e-mail: SJV1@nrc.gov</p>
<p>4:00 p m – 5:30 p m Salon A-C</p>	<p style="text-align: center;">State of the Art Reactor Consequence Analysis (SOARCA) Track 3 – Reactor Research</p> <p>Question 1: What will the new models and results from this study be used for? Were these purposes known and used to direct the project scope, level of detail, and analysis methods?</p> <p>Question 2: What impacts will the Feb. 25 ACRS letter to the NRC Chairman on SOARCA have on the project?</p> <p>Question 3: Is there an experimental basis for determining operability of severe accident mitigation equipment, considering the extreme environments?</p> <p>Question 4: You mentioned that we are including 1% of the sequences of importance to safety, so we are not using an exclusive approach. This was not clear, please clarify.</p> <p>Session Chair: Farouk Eltawila, NRC/RES Session POC: Alison Rivera, NRC/RES, tel: (301) 415-5059 e-mail: ALD2@nrc.gov</p>

Wednesday, March 12, 2008

11:00 am – 12:30 pm
Salon D

Construction Inspection Program
Track 4 – New Reactors

Question 1: Dolan, in your opinion, will the reactor vendors have detailed design complete when construction begins? Tracy, what actions can/will NRC take if detailed design is not complete when construction begins?

Question 2: Dolan, did I understand correctly that all installations will be by design? If yes, does that include small bore? Do you expect modular design and installation? How do you control field changes and requests?

Question 3: Dolan, what are the pressures you are seeing/experiencing that are driving you toward the past, e.g., financial pressure to move forward while design is still being finalized?

Question 4: What actions is Duke taking to provide a high degree of confidence on cost prior to making major financial commitments? Are you confident they will be effective?

Question 5: Dolan, with new design technology, do you foresee more automation of design basis information conversion into operating tools, technical specifications, operating procedures, tests, and scheduled maintenance?

Question 6: What are the remaining hurdles that must be overcome before Duke makes a decision to build a new plant?

Question 7: QA/QC staff represented about 18% of the workforce at plants under construction in the mid-1970s but swelled to nearly 50% of the workforce by the mid-1980s, greatly increasing the cost of construction. What percentage of the workforce do you anticipate the QA/QC staff to represent at new plants under construction? We expect to integrate and share oversight resources with suppliers and amongst the owners. Do you have a feel for the percentage of QA/QC personnel that will be required?

Question 8: How do you plan to schedule vendor inspections to verify ITAACs? Do you expect vendors to coordinate with the NRC for scheduling of their activities?

construction?

Question 14: Grier, you indicated in an answer to a question, that when a significant finding occurs you notify NUPIC systems and members. How does the global nuclear power industry find out? Through NRC? Through the grapevine?

Question 15: Are there plans to address suppliers that work to ISO-9001 only meeting 10CFR52 and 10CFR50 App B requirements?

Question 16: In the 1980s and 1990s, the industry and NUPIC did a good job of reviewing vendor QA programs and putting vendors on approved supplier lists. However, the reviews often did not detect significant product noncompliance and fraudulent parts. What has changed in the industry's approach to address these issues?

Question 17: Has consideration been given to placing personnel in supplier facilities to help establish a nuclear safety culture quality mindset? Audits may be too late to catch fraudulence.

Question 18: Our company has received a NIAC audit, but not a NUPIC audit. We frequently get asked to supply services to utilities directly. Do you think a NIAC audit will ever suffice for a NUPIC audit?

Question 19: Does NUPIC anticipate any significant challenges from (a) the transition of many members from "45.2" programs to NQA-1 programs, (b) provisions of the Pt 52 process, including timing of license vs. Construction, and/or (c) the increased use of contractor staff for what some used to do in-house?

Question 20: What special challenges does the panel see with the emphasis on modular construction, especially QA/QC and inspections?

Question 21: To what extent has the NRC integrated its inspection program with the LWA process?

Question 22: One of your three goals was to have design complete prior to construction. While a laudable goal, designs have not been complete, but construction has started. Specifically, COLAs are still under review but long lead times are being built now. How is NRC going to address inspection follow-up as design completes? Designs will only be complete to the maximum extent practical and some construction will continue in parallel with completing design. What mechanisms will the NRC rely on for configuration control as applicants/licensees complete design?

Question 23: Does NRC foresee reopening ITAAC already closed out and accepted by the NRC as closed? Is closed out ITAAC above allowed further hearing?

Question 24: Has the NRC considered the use of statistical process control (SPC) ITAACs sampling to select ITAACs?

Session Chair: Glenn Tracy, NRC/NRO and Loren Plisco, NRC/R-II

Session POC: Roger Rihm, NRC/NRO, tel: (301) 415-7807 e-mail: RXR3@nrc.gov

11:00 am – 12:30 pm
Salon E

Lessons Learned from International Operating Experience
Track 2 – Operating Reactors

Question 1: What can the NRC do to be more timely in issuance of generic communications?

Question 2: How do you resource an operating experience team at the regulatory body? What would be a minimum compliment? Do you believe that the INES and IRS systems

	<p>meet their purpose? Does the NRC use them?</p> <p>Session Chair: Mary Jane Ross-Lee, NRC/NRR Session POC: Greg Bowman, NRC/NRR, tel: (301) 415-2939 e-mail: GTB1@nrc.gov</p>
<p>11:00 am – 12:30 pm Lower Level Entrance Marinelli & Executive Blvd</p>	<p style="text-align: center;">Incident Response Experience Track 5 – Nuclear Security, Emergency Preparedness, Fuel Cycle</p> <p>All questions answered onsite.</p> <p>Session Chair: Brian McDermott, NRC/NSIR Session POC: Janelle Jessie, NRC/NSIR, tel: (301) 415-6775 e-mail: JRB6@nrc.gov</p>
<p>11:00 am – 12:30 pm Brookside</p>	<p style="text-align: center;">Aging and Life Beyond 60: The Next License Renewal Period(s) Track 3 – Reactor Research</p> <p>All questions answered onsite.</p> <p>Session Chair: Jennifer Uhle, NRC/RES Session POC: Gene Carpenter, NRC/RES, tel: (301) 415-7333 e-mail: CEC@nrc.gov</p>
<p>11:00 am – 12:30 pm Salon F-H</p>	<p style="text-align: center;">Emerging Issues: Electrical – Generic Circuit Breaker Issues Track 2 – Operating Reactors</p> <p>Question 1: What is the NRC and industry doing about counterfeit circuit breakers and sub-components? Recently Square D had a big recall due to this issue with molded case circuit breakers.</p> <p>Session Chair: Patrick Hiland, NRC/NRR Session POC: Kerby Scales, NRC/NRR, tel: (301) 415-1369 e-mail: KVS1@nrc.gov</p>
<p>2:00 pm – 3:30 pm Salon D</p>	<p style="text-align: center;">International Activities on New Reactors Track 4 – New Reactors</p> <p>Question 1: Considering that it is typical for vendors to interact with and support regulators reviewing their designs, what processes are being implemented to facilitate vendor support for the MDEP design working groups?</p> <p>Answer 1: Membership in MDEP is limited to national regulatory authorities. The industry does have parallel efforts such as the World Nuclear Association program on international standardization, and the cooperative discussions among Codes and Standards organizations. MDEP will communicate and cooperate with such organizations, in an open manner, where appropriate. Vendors presenting their reactor designs to multiple regulators can best support the MDEP by ensuring that they communicate openly and consistently with all regulators.</p> <p>Question 2: Understanding that there is a need to firmly establish MDEP's processes for reactors, what is the likelihood of eventually extending MDEP to include fuel cycle facilities (e.g., recycling plants)?</p>

	<p>Question 3: Is training and licensing of operators consistent from country to country; design to design?</p> <p>Answer 3: The MDEP is design-centered program, and was not intended to address operator licensing and training. As such, no data has been gathered under the MDEP program on operator licensing or training.</p> <p>Session Chair: Gary Holahan, NRC/NRO Session POC: Robert Elliott, NRC/NRO, tel: (301) 415-1397 e-mail: RBE@nrc.gov</p>
<p>2:00 pm – 3:30 pm Lower Level Entrance Marinelli & Executive Blvd</p>	<p style="text-align: center;">Incident Response Experience Track 5 – Nuclear Security, Emergency Preparedness, Fuel Cycle</p> <p>All questions answered onsite.</p> <p>Session Chair: Brian McDermott, NRC/NSIR Session POC: Janelle Jessie, NRC/NSIR, tel: (301) 415-6775 e-mail: JRB6@nrc.gov</p>
<p>2:00 pm – 3:30 pm Salon E</p>	<p style="text-align: center;">Digital Instrumentation and Control Licensing for Power Reactors Track 2 – Operating Reactors</p> <p>Question 1: Foreign reactors (Japan, Germany, etc...) have used digital systems for many years. Are you using this experience in lieu of re-invention which could cause unintended consequences?</p> <p>Question 2: How do back-fitting operating reactors with digital technology improve nuclear safety over existing technology? Identify specific application technology that has been identified to be problematic. What is being done to resolve the problems?</p> <p>Question 3: How vulnerable is digital I&C to an EMF burst when compared to existing technology? To what extent has this issue been reviewed?</p> <p>Question 4: Is a "mix" of old and new technology being considered?</p> <p>Question 5: To what "extreme" test standards are digital I&C actually tested? Is this testing at the component or system level?</p> <p>Question 6: A 30 minute response time is assumed for operator action. What is the basis for this 30 minute time? A reactor can be tripped at an earlier time (5 to 10 minutes).</p> <p>Question 7: To what degree have NRC / NPP and FERC cyber-security requirements and guidance been coordinated / "made consistent"? What are the plans for doing so?</p> <p>Question 8: Don't separation issues limit the use of digital equipment in non-safety related systems?</p> <p>Session Chair: William Kemper, NRC/NRR Session POC: Kerby Scales, NRC/NRR, tel: (301) 415-1369 e-mail: KVS1@nrc.gov</p>
<p>2:00 pm – 3:30 pm Brookside</p>	<p style="text-align: center;">New Reactor Siting Safety Reviews Track 4 – New Reactors</p> <p>Question 1: What is the likelihood that a review would lose its place in line if major sections of the filing lack what the NRC concludes is sufficient detail?</p>

Answer 1: The staff expects that the applicant will provide sufficient information in order for the staff to accept the application. If an application is deficient, so that the staff cannot accept the application, then the applicant would need to revise/supplement its application and resubmit. The staff would then propose a new plan for when it would be able to conduct the acceptance review based on priorities and existing workload.

As discussed in NRC Regulatory Information Summary 2008-01, "Process for Scheduling Acceptance Reviews Based on Notification of Applicant Submission Dates for Early Site Permits, Combined licenses, and Design Certifications and Process for Determining Budget Needs for Fiscal Year 2010," the staff will allocate resources to accomplish a review based on the applicant's declaration of expected submission date. However, if, during the application review, problems with responses to requests for additional information, design changes, or delays in supplemental information occur, the schedule could be significantly impacted if the staff has to perform re-work or re-plan its resources, awaiting information from the applicant. These delays may be more than day-for-day for delayed information, as the resources may also be committed to other projects such that they are unavailable when the delayed information arrives.

Question 2: What is the average area extent of hydrological exploration for siting of a Nuke?

Question 3: In estimation of probable maximum flooding for the new reactor site, what is the time span generally considered for the sea level variation related with climate change?

Question 4: Are there any new methods that you use for the calculation of the probable maximum precipitation and could you recommend the best one, if any? If you use the Depth-Area-Duration method for assessing PMP, what's the minimum size of the area applicable?

Question 5: On Meteorology site characteristics global warming in causing unpredictable weather events; therefore historical values may not be valid. How do you model future unknown weather events?

Question 6: What is the likelihood that a review would lose its place in line if major sections of the filing lack what the NRC concludes is sufficient detail?

Question 7: Technical Standards for the evaluation and review of the effect of, and design basis for the surface faulting caused by a capable tectonic source near the site?

Question 8: I understand that the seismic issues on high-frequency ground motion were resolved for the ESP of NPPs in the US, with applying revised USNRC SRP and ISG. For which NPPs were the seismic issues resolved? And how can I get the relevant documents on the resolution such as SERs and applicant's reports?

Question 9: According to SRP 3.7.2 the effects of incoherent ground motion can be taken into account in the seismic response analysis for reducing the potential effects of high frequency ground motion input. Is it applicable only to high frequency ground motion input or is it possible to broad-banded frequency ground input also? If it is not applicable to the broad-banded input, what's the reason?

Question 10: Until when is the ISG on high-frequency ground motion effective? Is the ISG going to be incorporated in other NRC's regulatory document such as the SRP or RG sometime?

Question 11: How will new information gathered or interpreted during NGA-East be factored into ongoing applications?

	<p>Question 12: Does the recurring nature described in the definition of “capable tectonic sources” of the Appendix A to 10 CFR 100 simply mean two fault movements within the last 500,000 years? In other words, if a fault moved two times or more only in a short period (e.g. 10,000 or 1,000 year-time period) during the last 500,000years, but with no other movements during the rest of the period, do you still call the fault a capable tectonic sources?</p> <p>Session Chair: Nilesh Chokshi, NRC/NRO Session POC: Zahira Cruz-Perez, NRC/NRO, tel: (301) 415-3808 e-mail: ZLC@nrc.gov</p>
<p>2:00 pm – 3:30 pm Salon F-H</p>	<p style="text-align: center;">Operating Reactor Licensing Track 2 – Operating Reactors</p> <p>Question 1: Even after successful acceptance reviews and months of technical review, some LARs still seem to be “hung up” by continuing Requests for Additional Information within a few weeks of the licensee “need date”. In some cases the RAls question the current plant configuration not the proposed configuration. What can be done to minimize these situations?</p> <p>Question 2: When does the clock start for your timeliness metric – before or after the acceptance review is completed?</p> <p>Question 3: How will the use of precedence (previously acceptable submittals) be impacted by the acceptance review process?</p> <p>Question 4: Are efforts being taken to minimize changes in submittal reviewers?</p> <p>Question 5: What are your thoughts on pre-submittal meetings on complex LARs or LARs that have no clear precedence?</p> <p>Question 6: When will the NRC’s internal procedure for acceptance reviews be available to the public as a final document?</p> <p>Question 7: Will the LIC on acceptance reviews be a “living document” at least for an initial roll-out period? I expect industry (LATF) will give you feedback that would help improve the process.</p> <p>Question 8: Have you established timeliness metrics for completing the new acceptance review process? If so what are they?</p> <p>Question 9: What tools will reviewers be given to help ensure standardized acceptance reviews? What degree of management oversight is planned to confirm that different reviewers come to similar conclusions?</p> <p>Session Chair: Catherine Haney, NRC/NRR Session POC: Peter Bamford, NRC/NRR, tel: (301) 415-2833 e-mail: PJB1@nrc.gov</p>
<p>3:30 pm – 4:00 pm</p>	<p style="text-align: center;">Break</p>
<p>4:00 pm – 5:30 pm Brookside</p>	<p style="text-align: center;">LOCA: Cladding Embrittlement Track 3 – Reactor Research</p> <p>Question 1: Confirm that ANL [Argonne National Laboratory] uses the Cathcart-Pawel oxidation relation and JAEA [Japan Atomic Energy Agency] uses the Baker-Just relation to calculate ECR [Equivalent Cladding Reacted].</p>

Answer 1 [ANL]: That is correct. ANL uses the Cathcart-Pawel oxidation relation and JAEA uses the Baker-Just relation to calculate ECR.

Question 2: Other than being nice to have more data, what specific deficiencies do you see in NRC's rulemaking strategy that require more data prior to changing the 17% limit to a performance-based limit that will apply to all zirconium alloys, including M5?

Answer 2 [Electric Power Research Institute (EPRI)]: That depends to a great extent on what NRC will propose for the revised criteria and how it will propose addressing issues such as those raised by IRSN (at this meeting) or by the ongoing experimental program at Halden. Without a clearer understanding of the potential impact of phenomena such as the uptake of oxygen from the ID surface of the cladding, the brittle behavior of the ballooned region, extent of fuel relocation into the ballooned region, dispersal through the burst opening, etc. the regulatory tendency is likely to be to address these phenomena in an unnecessarily conservative manner, assuming that they are all 100% relevant.

Question 3: Initially, the USAEC [U.S. Atomic Energy Commission] chose ductility rather than strength because LOCA [loss-of-coolant accident] loads were essentially unknowable. What is the basis for the maximum load assumed in Japan?

Answer 3 [JAEA]: The maximum load has been investigated experimentally in JAEA and Japanese industries. The maximum load of 540 N (50 kgf), used in the JAEA's thermal shock test, is the highest value measured in these experiments. Most data are ~200 N or lower, but we adopt the 540 N as a conservative, bounding condition.

Question 4: The [Halden] 650.4 rod was about 90 GWd/MtU. Would IRSN support the testing of a more reasonable burnup (60 – 70 GWd/MtU) to remove excessive pellet degradation from the considerations?

Answer 4 [Institut de Radioprotection et de Sûreté Nucléaire (IRSN)]: The Halden test matrix should of course be complemented by tests performed at burnups around 60-70 GWd/MtU. Testing at higher burnups will nevertheless remain useful for our understanding of burnup effect on relocation and dispersion, and should not be excluded from our investigation field.

Results from other experimental programmes (ANL, FLASH...) have shown a high fragmentation of fuel in the burst region for burnup around 50 GWd/MtU, thus HALDEN IFA 650-4 results shall not be disregarded.

Question 5: Experimental data show hydrogen in [the] burst region to be the main problem/uncertainty. In 50.46 proposed rulemaking, has NRR considered (a) limiting $PCT < T_{burst}$ and (b) reducing transition break size to ~SBLOCA? BE methods should show $PCT < T_{burst}$ and the need to understand H₂ effects would go away.

Answer 5 [NRC]: NRC has no plans to change the peak cladding temperature (PCT) limit of 1204°C (2200°F) in 10 CFR Part 50.46(b). Since cladding rupture occurs at substantially lower temperatures (e.g., 800°C - 900°C), the change proposed in this question would be very limiting. For current operating reactors, it is doubtful that even best-estimate methods could ensure that $PCT < T_{burst}$ for the large break loss-of-coolant accident. For smaller break sizes (i.e., below transition break size), such behavior is possible. However, NRC has no plans to reduce transition break size to account for cladding behavior.

Question 6: We all understand that the mechanism of embrittlement is related to the beta layer. Do you see any problem with NRC's using an empirical correlation that is related to calculated oxidation?

Answer 6 [IRSN]: Defining a safety criterion based on a calculated oxidation rate is

consistent with the original approach of the 1973 criterion, but will require (a priori) a calculation methodology that is conservative with regard to all the transients and physical mechanisms that could affect the clad ductility.

Since embrittlement is directly related to the beta layer and its content of O and H but is not directly related to the cladding oxidation rate, the approach of USNRC presents two types of risk:

- the first is to forget or fail to consider some possible combinations of physical phenomena when fixing the maximum acceptable oxidation rate and thus create a non-conservative criterion,
- the second is that a too simple criterion formulation might lead, in some situations, to an excessive conservatism.

Question 7: You suggested using impact tests and using evaluation of strength as a criterion. This was specifically turned down in the "Statement of Considerations" in the 1973 Rulemaking as very impractical. How would you deal with thermal stress during quench and vibrations?

Answer 7 [EPRI]: We suggested that strength as measured by impact resistance or by survivability of quench under an axial load (such as done in Japanese experiments) could be used as an alternative to ductility. In addition to giving us some margin, a strength-based approach is likely to give us a means for addressing the brittle ballooned region. The thermal stresses that occur during quench are specifically addressed by the quench survivability tests.

Question 8: With respect to the issue of "chips and fines" released during RIA tests, what is the NRC's position on fuel dispersal from a burst region during a LOCA test conducted by [Halden and cited by] IRSN?

Answer 8 [NRC]: The concept of "chips and fines" was used in the Research Information Letter 0401 as a possible explanation for data scatter in the onset of cladding plastic strain measurements in RIA tests. It does not refer to fuel relocation and dispersal observed in the Halden LOCA tests cited by IRSN. NRC is reviewing the relocation and dispersal issue in the context of 10 CFR 50 Appendix K (LOCA models) rather than 10 CFR 50.46(b) (cladding embrittlement).

Question 9: With respect to CABRI RIA testing, what is the hydrogen concentration in the various tests? Were SEM analyses done for the various test samples? Has this information be[en] generally released to the industry?

Answer 9 [IRSN]: The cladding hydrogen concentration of fuel rods depends mainly on the clad and of the burnup. A large spectrum of local and average hydrogen concentrations has been covered by fuel rods tested in CABRI: up to 1370ppm and locally up to 2000ppm. Hydrogen concentrations have been systematically measured and results have been made available for all the CABRI programme partners.

Question 10: What was the maximum fuel burnup tested?

Answers for 10:

[ANL] Rod average burnups are listed on Slide 13 in the ANL presentation. With regard to high-burnup cladding alloys tested to date, the highest are: about 70 GWd/MTU rod averaged and about 76 GWD/MTU local burnup.

[EPRI] The Halden test (IFA 650.4) that resulted in fuel dispersal used a fuel specimen with a butnup of 91.5 GWd/MTU.

[IRSN] Fine fuel fragmentation has been observed in the HALDEN test 650-4 for 91.5 GWd/MtU, but also in tests FLASH-5, ANL ICL-2 and Halden test 650-5 respectively

	<p>for 50, 56 and 83 GWd/MtU.</p> <p>[JAEA] ~76 GWd/t at JAEA.</p> <p>Question 11: Is there a performance-based hypothetical burnup limit for Zr-2 and Zr-4 fuels?</p> <p>Answer 11 [NRC]: No. As long as hydrogen absorption is controlled to a low level, no burnup limit is foreseen for any cladding alloy. On the other hand, the recent Halden test (IFA-650.4) suggests that there might be a burnup limit associated with the fuel as opposed to the cladding. In that test, conducted at a burnup of about 92 GWd/t, a very large "rim" structure developed in the pellet. This resulted in a substantial volume of particulate fuel, which flowed out of the burst opening under gravity. Only small "rims" are seen at the current operating limit of 62 GWd/t, so there is probably a need for a technically-based limit at some burnup around or above the current operating limit.</p> <p>Session Chair: Farouk Eltawila, NRC/RES Session POC: John Voglewede, NRC/RES, tel: (301) 415-7415 e-mail: JCV@nrc.gov</p>
<p>4:00 pm – 5:30 pm Salon F-H</p>	<p style="text-align: center;">Fire Protection: Recent Achievements and Remaining Challenges Track 2 – Operating Reactors</p> <p>All questions answered onsite.</p> <p>Session Chair: Mark Cunningham, NRC/NRR Session POC: Chuck Moulton, NRC/NRR, tel: (301) 415-2751 e-mail: CEM4@nrc.gov</p>
<p>4:00 pm – 5:30 pm Salon A-C</p>	<p style="text-align: center;">Nuclear Security Track 5 – Nuclear Security, Emergency Preparedness, Fuel Cycle</p> <p>Question 1: In terms of radiological sabotage including intended aircraft crash, how does the NRC deal with security, safety, and operational interface?</p> <p>Question 2: Will the Part 73 rulemaking NRC is pursuing affect the RRTT concept?</p> <p>Question 3: Does incorporation of answers to Security Frequently Asked Questions (SFAQ) in security plans automatically fall under 50.54p?</p> <p>Question 4: Regarding the Palisades Nuclear plant, has there been/is there a "No Go" exclusion zone in Lake Michigan? If not, why not? If yes, why are recreational watercraft allowed to anchor immediately offshore from Palisades? How is the presence of a "No Go" zone communicated to the general public, given a lack of signage in such a highly trafficked are of Lake Michigan?</p> <p>Question 5: Where do you see the link between the security plan and an emergency plan in a COLA submittal?</p> <p>Question 6: Has NRC improved security guard/security director hiring screening safeguards in light of the hiring of William "Zeke" Clark at Palisades by Consumers Energy and his retention by Entergy as reported by Esquire magazine in May 2007? If yes, what improvements have been implemented? If not, why not?</p> <p>Session Chair: Dan Dorman, NRC/NSIR and Trish Holahan, NRC/NSIR Session POC: R. John Vanden Berghe, NRC/NSIR, tel: (301) 415-7142 e-mail: RJV@nrc.gov</p>

<p>4:00 p m – 5:30 p m Salon D</p>	<p style="text-align: center;">New Reactor Technical Issues/Systems Track 4 – New Reactors</p> <p>Session Chair: Frank Akstulewicz, NRC/NRO Session POC: Harry Wagage, NRC/NRO, tel: (301) 415-1840 e-mail: HAW2@nrc.gov</p>
<p>4:00 p m – 5:30 p m Lower Level Entrance Marinelli & Executive Blvd</p>	<p style="text-align: center;">Incident Response Experience Track 5 – Nuclear Security, Emergency Preparedness, Fuel Cycle</p> <p>All questions answered onsite.</p> <p>Session Chair: Brian McDermott, NRC/NSIR Session POC: Janelle Jessie, NRC/NSIR, tel: (301) 415-6775 e-mail: JRB6@nrc.gov</p>
<p>4:00 p m – 5:30 p m Salon E</p>	<p style="text-align: center;">Region I, II, III and IV Breakout Session Track 6 – Regional Breakout</p> <p>Session Chair: Bruce Mallett, NRC/EDO Session POC: Randy Musser, NRC/R-II, tel: (404) 562-4603 e-mail: RXM1@nrc.gov</p>

Thursday, March 13, 2008

<p>8:00 a m – 9:30 a m Salon A-C</p>	<p style="text-align: center;">Spent Fuel Storage and Disposal Track 5 – Nuclear Security, Emergency Preparedness, Fuel Cycle</p> <p>All questions answered onsite.</p> <p>Session Chair: William Brach, NRC/NMSS and Lawrence E. Kokajko, NRC/NMSS Session POC: Yen-Ju Chen, NRC/NSIR, tel: (301) 492-3238 e-mail: YJC@nrc.gov</p>
<p>8:00 a m – 9:30 a m Salon F-H</p>	<p style="text-align: center;">Thermal-Hydraulic Code Development and Applications Track 3 – Reactor Research</p> <p>Session Chair: Stephen M. Bajorek, NRC/RES Session POC: Daniel Forsyth, NRC/RES, tel: (301) 415-5674 e-mail: DCF1@nrc.gov</p>
<p>8:00 a m – 9:30 a m Salon D</p>	<p style="text-align: center;">New Reactor Licensing: Matching Expectations and Reality Track 4 – New Reactors</p> <p>Question 1: When would it be appropriate to use Part 50 in lieu of Part 52 for licensing a commercial nuclear power plant?</p> <p>Answer 1: The applicant has the option to decide which licensing process is more appropriate in applying for a license. Part 50 is a two-step licensing process in which a Construction Permit can be issued based on a review of preliminary design information, site suitability, and environmental impacts. As construction is nearing completion, the applicant then applies for an Operating License, which includes final design information, conditions for plant operation, and supporting programs. Under the Part 50 process, a hearing on the Construction Permit is mandatory. There is a hearing on the Operating License application only if a petitioner for intervention demonstrates standing and proffers at least one admissible contention. Additionally, because construction is started before the design of the plant is completed, historically schedule slippages and cost increases have been the norm where there was the need for design changes and rework.</p> <p>The NRC established an alternative one-step licensing process in 10 CFR Part 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants,” which the staff believes is a more predictable and efficient licensing process. This process combines the Construction Permit and the Operating License (COL) with conditions for plant operation. However, the Part 52 process requires an essentially complete design as a condition for applying under Part 52. The Part 52 process has the advantages of one hearing on plant design, site suitability, and</p>

	<p>because a significant part of the licensing review has already been conducted and fewer issues need to be reviewed as part of the COL.</p> <p>Session Chair: Thomas Bergman, NRC/NRO Session POC: Meena Khanna, NRC/NRO, tel: (301) 415-2150 e-mail: MKK@nrc.gov and James Steckel, NRC/NRO, tel: (301) 415-1026 e-mail: JAS13@nrc.gov</p>
<p>8:00 a m – 9:30 a m Lower Level Entrance Marinelli & Executive Blvd</p>	<p style="text-align: center;">Incident Response Experience Track 5 – Nuclear Security, Emergency Preparedness, Fuel Cycle</p> <p>All questions answered onsite.</p> <p>Session Chair: Brian McDermott, NRC/NSIR Session POC: Janelle Jessie, NRC/NSIR, tel: (301) 415-6775 e-mail: JRB6@nrc.gov</p>
<p>8:00 a m – 9:30 a m Salon E</p>	<p style="text-align: center;">Risk Informed Regulatory Activities Track 2 – Operating Reactors</p> <p>Question 1: With the change in Commissioners, is there continued support for risk based initiatives?</p> <p>Question 2: Are there disagreements on results of RI decisions between NRC and utilities and how do you resolve them?</p> <p>Question 3: The new reactors (AP1000, EPR, ESBWR, etc.) may have very low core damage frequencies. Will the NRC revise the risk criteria?</p> <p>Question 4: What will be the role of PRA in addressing issues associated with “life beyond 60,” and aging issues?</p> <p>Question 5: How could we use risk-informed considerations to account for uncertainty in instrument set point-related technical specifications?</p> <p>Question 6: If you change surveillance intervals that will change the component of instrument uncertainty. Uncertainty will increase, therefore set points in tech specs need to be more conservative. Please comment.</p> <p>Question 7: Please provide some examples where a “business-case” PRA provides important and different results than a “safety-case” PRA.</p> <p>Question 8: The presentations focused on PRA modeling standards, etc. Where do you factor in risk-informed decision making?</p> <p>Question 9: Are there any plans by the PUROG to develop a basis or guidelines for a basis for a frequency for software common mode failures? This is needed for safety system software-based digital system upgrades when analyzing the change (delta) to both the CDF and CERF.</p> <p>Question 10: The vision of the future would be replacement of our system/component limiting conditions for operation with LCO’s based on collective risk. The industry has invested a lot of energy in putting our operators in “rule based” vs “knowledge based” space. The use of risk based flies in the face of this approach. What are your views on this conflict?</p> <p>Session Chair: Mark Cunningham, NRC/NRR Session POC: Andrew Howe, NRC/NRR, tel: (301) 415-3078 e-mail: AJH1@nrc.gov</p>

<p>8:00 a m – 9:30 a m Brookside</p>	<p style="text-align: center;">Research Findings Related to NRC Revised Source Term (NUREG-1465) Track 3 – Reactor Research</p> <p>Question 1: Clad oxidation under air ingress was observed to be peculiar. Is this different from the behavior observed in air oxidation experiments performed under the EU framework program a few years ago and in the ANL program performed subsequently?</p> <p>Answer 1: Clad oxidation under air ingress above 1000 °C is indeed more violent than under steam, for two reasons: the reaction between zirconium and oxygen is more energetic and nitrogen appears to make the oxide layer formed during the oxidation process unstable (break-away). In addition, zirconium nitrides may violently react with oxygen and burn.</p> <p>The data that we obtained from the International Source Term Program are confirming ANL results and are giving some insights on the break-away phenomenon.</p> <p>Question 2: Have the Phébus tests been compared to, or correlated with, the INL LOFT tests of the early 80's? Does Phébus simulate the typical proportionality of commercial PWR systems, structures, & components; and does Phébus use commercial PWR materials?</p> <p>Answer 2: There are not many differences between LOFT and Phébus data as far as fuel degradation and volatile fission product release rate are concerned. Phébus went further in fuel degradation than any experiments performed before and is giving quite new results concerning fission product transport and behaviour in containment. In particular, the data on iodine volatility in the containment are unique. Note that there was no containment model in the LOFT tests.</p> <p>Phébus simulates the fuel, cladding and fission product inventory closely. The control rod material inventory is slightly larger but this is not felt as a problem as it is already largely in excess in the reactor case as compared to the fission product inventory. The length and the surface of the circuit are certainly not at scale, but fission product deposition along the circuit is not that large. The volume and the cooled surfaces (inner condensers located at the centre of the model) of the containment model are at scale; the outer surface of the containment is heated in order to avoid any steam condensation and be as neutral as possible regarding fission product deposition. The sump volume and surfaces are not totally at scale, the option taken being to favour representative radiation level conditions.</p> <p>The fuel rods used in Phébus FPT-1, FPT-2 and FPT-3 tests came from the pressurized water reactor BR3, in Belgium; they were typical UO₂ Zircaloy 4 clad fuel rods with a little bit more than 20 GWd/TU. The control rod simulator was made of typical SIC alloy used in PWRs, stainless steel clad and located in a Zircaloy 4 guiding tube.</p> <p>Session Chair: Richard Lee, NRC/RES Session POC: Michael Salay, NRC/RES, tel: (301) 415-5603 e-mail: MAS10@nrc.gov</p>
<p>8:00 a m – 9:30 a m White Flint Amphitheater</p>	<p style="text-align: center;">Increased Openness and Transparency in NRC Security Inspection Programs Track 5 – Nuclear Security, Emergency Preparedness, Fuel Cycle</p> <p>All questions answered onsite.</p> <p>Session Chair: Rich Correia, NRC/NSIR Session POC: Paul W. Harris, NRC/NSIR, tel: (301) 415-1169 e-mail: PWH1@nrc.gov</p>
<p>9:30 a m – 10:00 a m</p>	<p style="text-align: center;">Break</p>

10:00 am - 11:30 am
Salon A-C

Ground-Water Contamination Assessments for NRC-Licensed Facilities
Track 3 – Reactor Research

Question 1: Given that ground-water contamination isn't truly a regulatory issue, what more action will or should the NRC staff take on this issue?

Question 2: NRC allows 1 million picocuries of tritium per liter in ground-water, while EPA's Safe Drinking Water Act limit is 20,000 picocuries per liter. The State of Colorado and California however have standards in place 40 to 50 times more protective than the EPAs. Given this, given NAS BEIR VII's recognition that even low level radioactive exposure carries health risks, and given chronic public exposure to tritium and the enhanced risk of organically bound tritium, how can NRC continue to downplay tritium's health risks?

Question 3: The foundation design of the NPP should take into account local ground-water flow and transport. Why then, should there be uncertainty in ground-water flow and transport determination for the local hydrologist?

Question 4: In relation to the EPRI graded approach, how do you determine "high potential" sites to develop numerical models? How do you address uncertainty in data and methods?

Question 5: Is there an ASTM, EPRI, or ANSI standard established for monitoring well design, installation, and operation depending on hazard (planning for radionuclide vs. organic hydrocarbons detection)?

Question 6: According to the LLTF's 26 consolidated recommendations, NRC should develop or revise or provide guidance to the industry. Are there any newly developed or revised or provided NRC regulations/guidance to address remediation?

Question 7: Are there any reported instances of ground-water contamination due to leakage from nuclear power plant structures and systems through reactor foundation concrete basemats?

Question 8: Detection of ground-water contamination in wells suggests that failure has already occurred. Have you thought of detection at the interface between the source

Question 15: Given that the in-situ ppn process may add large amounts of Fe and SO₄ to the water, does subsequent dissolution/oxidation of the iron sulfides affect ground-water quality?

Question 16: Would the in-situ treatment be applicable to the kinds of radio nuclides we have seen at nuclear plant site, including tritium, strontium-90, and cobalt-60?

Question 17: In evaluating the long term performance of the remediation process, how is the change in stresses in the materials and geologic strata beneath the major structures considered? The removal of structures will change the transport characteristics.

Question 18: In view of the long life of radio nuclides, is MNA really a viable remediation technique?

Question 19: Are there attempts made to monitor the downstream of the highly contaminated C4 agriculture products – cattle, milk, meet, live farms, shrimp, salmon, etc.?

Question 20: Long term safety case assessments at Yucca Mountain show importance of colloids in more rapid mass transport issues in V.Z. Has this been considered in site assessments/recommendations?

Question 21: What design changes will be used for new reactors to prevent ground-water contamination in the future – especially from pool storage?

Session Chair: Sher Bahadur, NRC/RES

Session POC: Adam Schwartzman, NRC/RES tel: (301) 415-8172 e-mail: ALS2@nrc.gov

10:00 am-11:30 am
Salon E

Rulemaking Program: Looking Below the Surface
Track 2 – Operating Reactors

Question 1: At a previous RIC, Skip Bowman said that if he NRC wants to require actions by the industry, the NRC should do it via rulemaking. Is this still the NEI position?

Question 2: What is NEI's view on when industry should be involved in the Tech Basis development? Would it be later in the rulemaking process or earlier?

Question 3: Is the Regulatory Guidance from NEI-07-06 available to the public/NRC personnel?

Question 4: Please define "ROP."

Question 5: Please provide a recent example of a new rule which drove industry away from safety.

Question 6: Please provide an example of staff back fitting outside the process.

Question 7: You mentioned "Informal Backfilling" is occurring. Can you give some

not in our regulations, why not in guidance documents?

Question 10: Executive orders versus rules – please explain impact on regulations and implementation.

Question 11: Is there agency consensus that technical basis must come first? What can be done to increase public confidence that comments will be considered seriously? Will there be public participation in attempts to resolve the rulemaking process?

Question 12: If technical basis work were completed prior to rulemaking as you suggest, could this lessen or even eliminate the need for guidance to be issued after the rule is finalized (e.g. the better the rule, the less guidance is needed to implement it)?

Question 13: Does UCS agree that the Emergency Planning Rulemaking is an example of “the good”?

Question 14: For UCS, which is it? Bad rules or bad enforcement? You started by saying the rules are fine and that NRC needed to better enforce. Then you criticized the rulemaking process as a step before legal action.

Question 15: For UCS, you assume we never get above 10. What if the new rule can get us to 12 because existing regulations provide the NRC purpose and goal, and the rulemaking will make it better?

Question 16: For UCS, regarding your fire protection issues and your compensatory actions – allowed. Are you suggesting that an “administrative” limiting condition for operation should always have a shutdown requirement or a time limit even if more compensatory measures provide an adequate level of safety?

Question 17: For UCS, have you considered that the NRC rulemaking process is what it is, in part because UCS has sued the NRC, and the result is the slow cumbersome approach? In short, the process is designed to prepare to be sued by you.

Question 18: Would development of guidance documents help developers of rule to find issues with rule before it is promulgated?

Question 19: If the technical basis is developed and approved, then why does final rulemaking still take many years? If technical basis is correct, then improvements in safety are unnecessarily delayed.

Question 20: What is the relationship on timing of NRC rulemaking, generic letters, or NUREGs once they are issued or proposed in the U.S. before it appears in Japan’s structure?

Question 21: UCS has made comments about the NRC’s procedures for a number of years. Does the NRC believe any of his comments are valid? If so, has the NRC ever adapted any?

Question 22: What is Japan’s opinion of the NRC rulemaking process?

Question 23: Mr. Yamashita, do the technical people write your regulations with the help of your attorneys OR do the attorneys write your regulations with the help of your technical staff?

Session Chair: Michael Case, NRC/NRR

Session POC: Paulette Torres, NRC/NRR, tel: (301) 415-5656 e-mail: PAT3@nrc.gov

<p>Brookside</p>	<p style="text-align: center;">Fire Safety, and the Treatment of Uncertainties Track 3 – Reactor Research</p> <p>All questions answered onsite.</p> <p>Session Chair: John Monninger, NRC/RES Session POC: Lauren Killian, NRC/RES, tel: (301) 415-0029 e-mail: LAK@nrc.gov</p>
<p>10:00 am - 11:30 am Salon D</p>	<p style="text-align: center;">New Reactor Design Reviews and Engineering Issues Track 4 – New Reactors</p> <p>Question 1: Will NRC develop fundamental design competence (like Allen Bradley, Siemens, Honeywell) in order to validate & verify digital I&C SSC design performance requirements?</p> <p>Answer 1: The NRC doesn't plan to develop competence with a particular product or vendor of I&C equipment. Rather, we develop competence in technical areas such as software development, data communications, etc. We will sometimes utilize training from a vendor or on a particular product to gain familiarity with that product and others similar to it.</p> <p>Question 2: Why doesn't NRC consider "upgrade" as part of I&C development lifecycle?</p> <p>Answer 2: The retirement phase of the I&C lifecycle was not depicted in the presentation. Digital upgrades would be considered as part of this phase. The Office of Nuclear Reactor Regulation (NRR) addresses digital upgrades for safety-related I&C systems.</p> <p>Question 3: At what point in the DAC scheduling process do you envision the vendors or COL applicants having their overall certification or licensing schedule impacted due to missed milestones based upon non-submittal or low quality submittal of design acceptance documents?</p> <p>Answer 3: The NRC is able to make a final safety conclusion in a design certification or licensing review based on adequate design acceptance criteria (DAC). Therefore, the absence of detailed design information associated with the DAC would not affect the review schedule. However, 10 CFR 52.99(c)(1) states, in part, that licensees shall notify the NRC that the prescribed inspections, tests, and analysis [ITAAC] have been performed and that the prescribed acceptance criteria have been met. 10 CFR 52.99(c)(2) states, in part, that if the licensee has not provided, by the date 225 days before scheduled date for initial loading of fuel, the notification required by paragraph (c)(1) of this section for all ITAAC, then the licensee shall notify the NRC that the prescribed inspections, tests, or analysis for all uncompleted ITAAC will be performed and that the prescribed acceptance criteria will be met prior to operation. Since DAC is an ITAAC, the absence, or low quality, of detailed design information would affect a licensee's ability to meet 10 CFR 52.99(c) and could potentially impact the scheduled date for initial loading of fuel.</p> <p>Session Chair: Laura Dudes, NRC/NRO Session POC: Denise McGovern, NRC/NRO, tel: (301) 415-0681 e-mail: DLM7@nrc.gov</p>
<p>10:00 am - 11:30 am Lower Level Entrance Marinelli & Executive Blvd</p>	<p style="text-align: center;">Incident Response Experience Track 5 – Nuclear Security, Emergency Preparedness, Fuel Cycle</p> <p>All questions answered onsite.</p>

	<p>Session Chair: Brian McDermott, NRC/NSIR Session POC: Janelle Jessie, NRC/NSIR, tel: (301) 415-6775 e-mail: JRB6@nrc.gov</p>
<p>10:00 am - 11:30 am Salon F-H</p>	<p style="text-align: center;">New and Advanced Reactor Research Track 3 – Reactor Research</p> <p>Question 1: What are some of the possible environmental issues associated with the PBMR and have there been resources allotted to resolve these issues?</p> <p>Question 2: Is there any plan to run tests at both high temperature and high pressure to get HT correlations under prototypic conditions?</p> <p>Session Chair: Christiana Lui, NRC/RES Session POC: Lauren Gibson, NRC/RES, tel: (301) 415-0114 e-mail: LKG1@nrc.gov</p>
<p>10:00 am – 4:00 pm White Flint Amphitheater</p>	<p style="text-align: center;">Post-Approval Site Inspection for License Renewal – Part I & II Track 2 – Operating Reactors</p> <p>Question 1: What will the inspection report look like for the IP 71003 inspection; will it be similar to that issued for the 71002 inspections?</p> <p>Question 2: Can the facilities docket the technical details of the review of newly identified SSCs in separate correspondence/packaging/submittals in accordance with 50.59 and 50.71 requirements? If so, the licensees could then provide a comparable level of detail as in their other systems or SSCs that are existing plant UFSAR.</p> <p>Session Chair: P.T. Kuo, NRC/NRR Session POC: Ngoc (Tommy) Le, NRC/NRR, tel: (301) 415-1458 e-mail: NBL@nrc.gov</p>